

APPENDIX C
FIT TESTS FOR NEGATIVE PRESSURE RESPIRATORS

C-1. All negative pressure respirators must be fit tested using a qualitative or quantitative procedure. Respirators used for protection against lead and/or arsenic require quantitative (see para C-4) or special qualitative fit tests (see para C-5).

C-2. A qualitative or quantitative fit test will not be performed until the wearer has been instructed in adjustment of the respirator and is capable of obtaining a successful negative pressure test, and positive pressure test (if the respirator design allows positive pressure testing). If a half facepiece respirator is being fit and the wearer is required to use safety glasses in performing his/her job, the user must be fit tested while wearing safety glasses. All personnel administering fit tests must be trained.

a. Negative Pressure Test. Using the palm(s) of the hand(s) cover the respirator inlet(s) and inhale slowly. A slight negative pressure should be noticed in the facepiece if a good facepiece to face seal exists.

b. Positive Pressure Test. Using the palm of the hand cover the respirator exhalation outlet and exhale slowly. A slight positive pressure should be noticed in the facepiece if a good facepiece to face seal exists.

C-3. Qualitative Fit Tests. The following are two fit test procedures which can be performed at most job sites with minimal equipment:

a. Isoamyl Acetate (Banana Oil). This test relies on the users' ability to smell the organic vapor isoamyl acetate (banana oil). Air purifying respirators (to be fit by this method) must be equipped with organic vapor cartridges or canisters. Saturate a piece of fabric, cotton, or sponge with liquid isoamyl acetate and move it around the respirator worn by the person being tested. The banana oil should be passed close to potential leak points in the facepiece to face seal while the wearer carries out exercises such as normal breathing, turning the head side to side, nodding up and down, and talking. If the wearer does not detect the banana odor, remove the respirator and check if the wearer can detect the banana odor. If the wearer can detect the odor without the respirator but not when wearing it, a satisfactory fit has been achieved. If the wearer is unable to obtain a satisfactory fit after several readjustments of the straps, a different brand respirator should be tried.

b. Irritant Smoke Test. This test relies on irritant effect to the nose and throat of smoke produced by passing air over commercially prepared ventilation smoke tubes (CAUTION: THIS SMOKE IS AN EYE IRRITANT, THEREFORE, THE WEARER MUST KEEP HIS/HER EYES CLOSED DURING TESTING EVEN IF THE RESPIRATOR OFFERS EYE PROTECTION). Air purifying respirators (to be fit by this method) must be equipped with high efficiency filters. Since this method relies on irritant effects, the smoke should first be directed toward the respirator from a distance of about two feet. If the wearer does not detect the smoke, move it in slowly to within six inches of the respirator (CAUTION: BE SURE THAT THE ENDS OF THE SMOKE TUBE ARE COVERED WITH A RUBBER SHROUD TO PROTECT THE WEARER FROM THE JAGGED GLASS ENDS). The wearer should perform

385-1-90
28 Mar 83

exercises such as normal breathing, turning the head from side to side, nodding up and down, and talking. If the wearer does not detect the smoke, the wearer has achieved a satisfactory fit. If the wearer detects the smoke, stop immediately and readjust the respirator. If, after several adjustments, a satisfactory fit cannot be achieved, a different brand respirator should be tried.

C-4. Quantitative Fit Tests. Quantitative fit tests involve exposing the respirator wearer to an atmosphere of nontoxic vapor, gas, or aerosol in a test chamber. The concentration of the test agent is then measured both in the chamber and inside the respirator and the protection factor calculated. This method requires special equipment which varies from manufacturer to manufacturer. Therefore, all quantitative fit test should be performed according to the manufacturer's instruction. However, NO RESPIRATOR SHALL BE USED IN A WORK ATMOSPHERE THAT WILL REQUIRE A PROTECTION FACTOR GREATER THAN THOSE LISTED IN APPENDIX A regardless of the protection factor calculated by quantitative testing.

C-5. Special Qualitative Fit Tests. Special qualitative fit test procedures, permitted for fit testing respirators used for protection against lead, are listed in 29 CFR 1910, 1025, Lead Standard, Appendix C, as added by 47 FR 51117, November 12, 1982.